COASTAL TX PROTECTION AND RESTORATION FEASIBILITY STUDY

Public Meetings

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US Army Corps of Engineers
Galveston District

Lower Coast: November 27-29, 2018
Upper Coast: December 11-18, 2018

"The views, opinions and findings contained in this report are those of the authors(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation."

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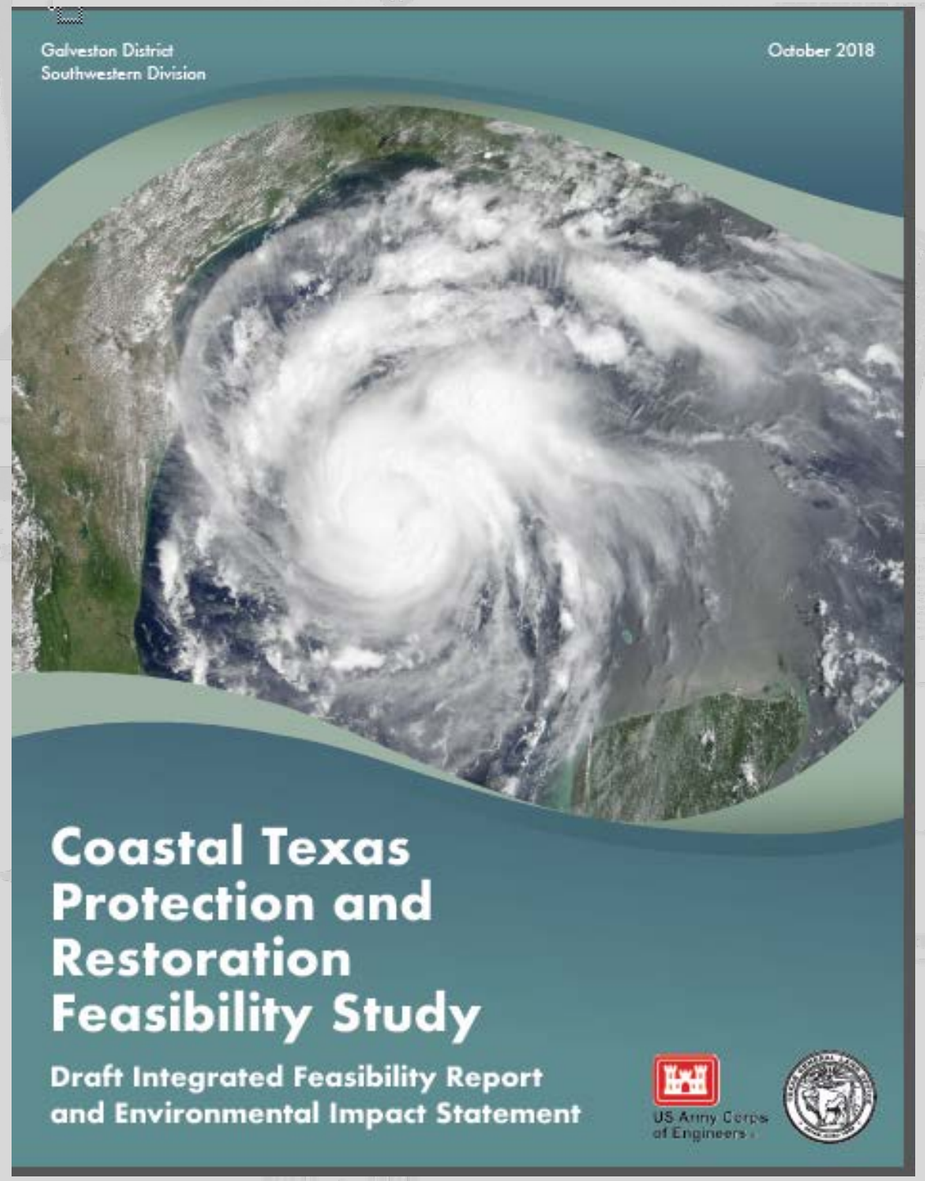
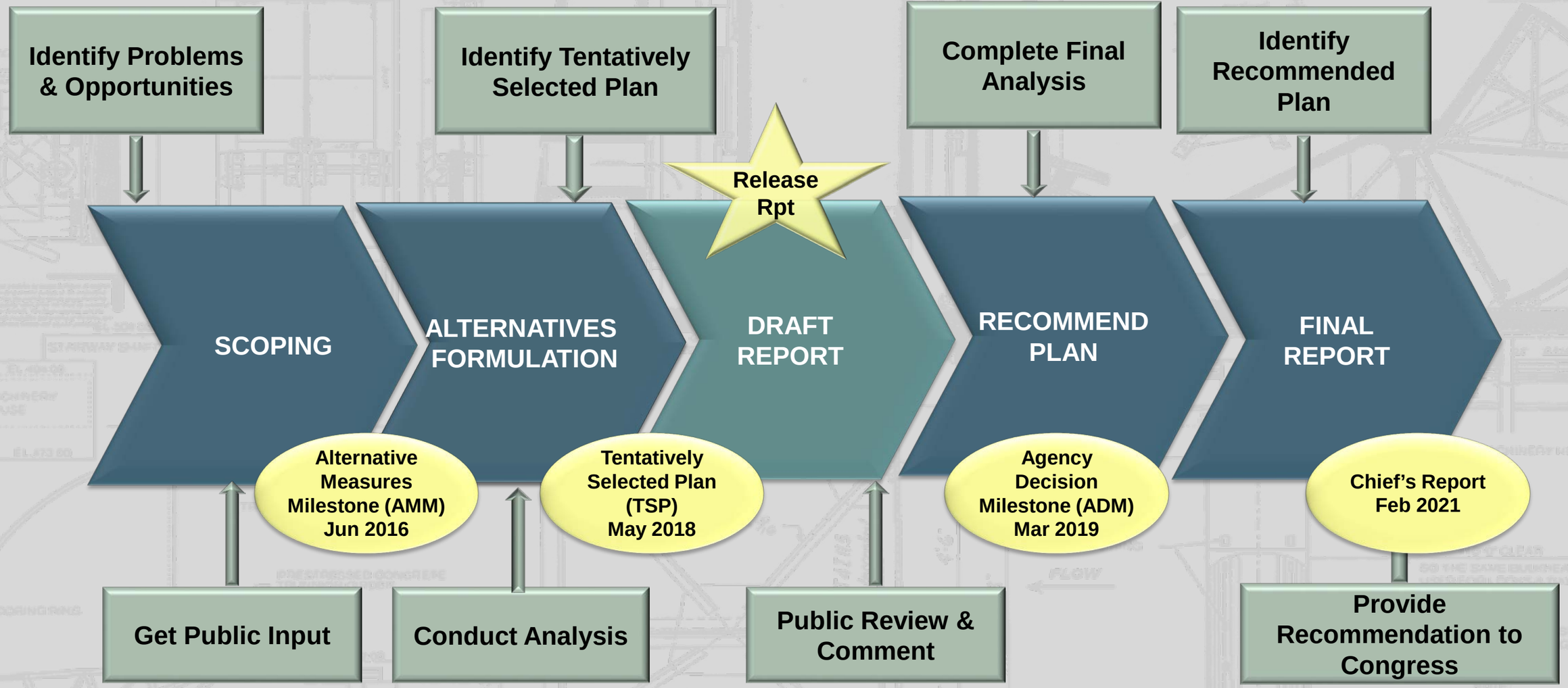
AGENDA

Why are we here?

1. **Provide** a status update on the study
2. **Describe** the National Environmental Policy Act (NEPA) process
3. **Describe** the USACE study process
4. **Identify** the Tentatively Selected Plan (TSP)
5. **Describe** the potential impacts, costs, & benefits of the TSP
6. **Receive** public comments



WHERE WE ARE TODAY



Upcoming Public Meetings:

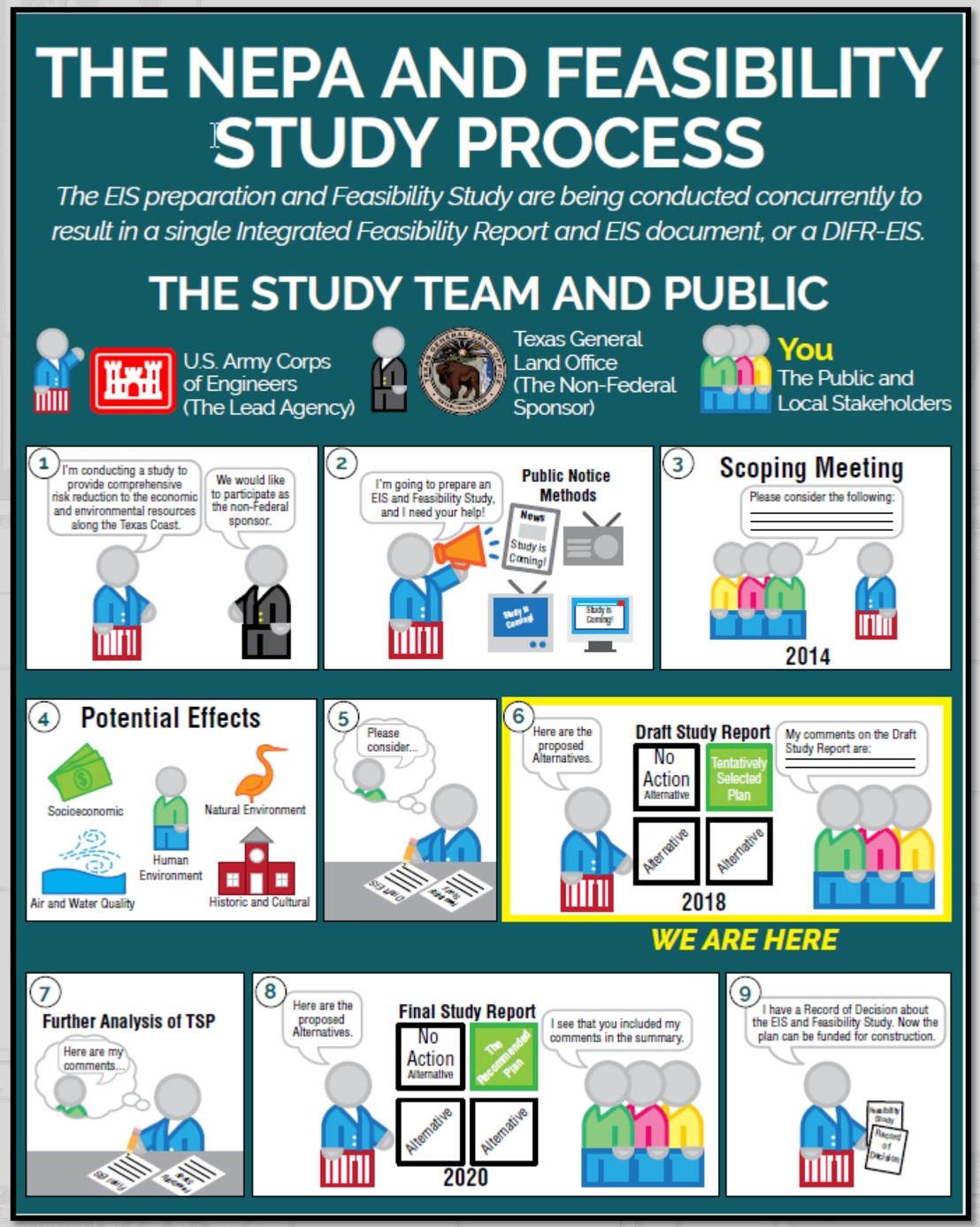
Lower Coast: Nov 2018
Upper Coast: Dec 2018

PUBLIC & AGENCY REVIEW

75-day review period

- Began: **October 26, 2018**
- Concludes: **January 9, 2019**

- Inviting public comment is **required by NEPA**
- All comments are **welcome** – positive or negative
- Remember: The **more specific** your feedback, the easier it will be for us to understand and address the issue(s)
- Public and agency input **informs decisions**
- **All comments** are fully evaluated prior to decision making
- Review & comment ensures decisions are based on the **best available information**



PROBLEMS

Economic damage from coastal storm surge

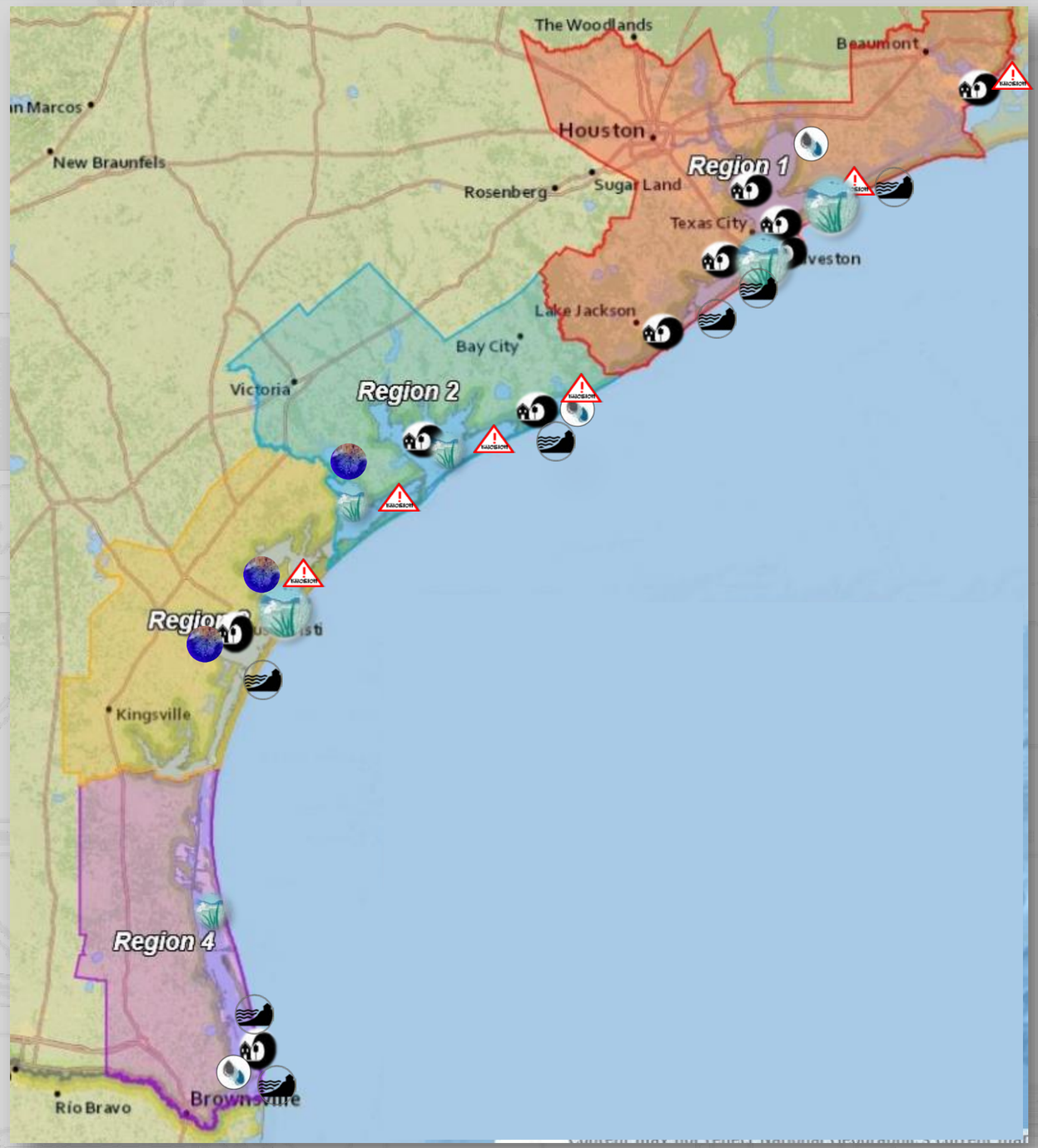
Inland shoreline erosion

Gulf shoreline erosion

Loss of T&E Critical Habitats

Loss of Natural Delta Processes

Disrupted Hydrology



PROJECT GOALS & OBJECTIVES

Goals

Coastal Storm Risk Management (CSRM)

Develop and evaluate **coastal storm damage risk reduction** measures for coastal Texas residents, industries and businesses which are critical to the nation's economy.

Ecosystem Restoration (ER)

Increase the net quantity and quality of coastal ecosystem resources by maintaining, **protecting, and restoring coastal Texas ecosystems** and fish and wildlife habitat

Objectives

- **Reduce economic damage** from coastal storm surge flooding to business, residents and infrastructure through 2085
- **Reduce risk to critical infrastructure** (e.g. medical centers, government facilities, universities, and schools) from coastal storm surge flooding to the maximum extent practical and reduce emergency costs
- **Reduce risk to public health and safety** from storm surge
- **Increase the resilience** of communities, the economy, coastal ecosystems, and infrastructure, including existing coastal storm risk reduction systems, from sea level rise and coastal storm surge
- **Enhance and restore coastal landforms** along Galveston Island and Bolivar Peninsula that contribute to reducing the risks of coastal storm surge damages
- **Improve hydrologic connectivity** of area wetlands in the Texas-Louisiana coastal marshes, mid-coast barrier islands and coastal marshes
- **Improve and sustain coastal marshes and bay shorelines** on barrier island and estuarine systems

NATIONAL SIGNIFICANCE

Population Centers

- 18 coastal counties
- 6.1 million residents
- >24% of the TX population

Navigation

- Nationally ranked deep-draft ports
  - Houston
  - Beaumont
  - Corpus Christi
  - Texas City
- 450 miles of Gulf Intracoastal Waterway (GIWW)

Industry

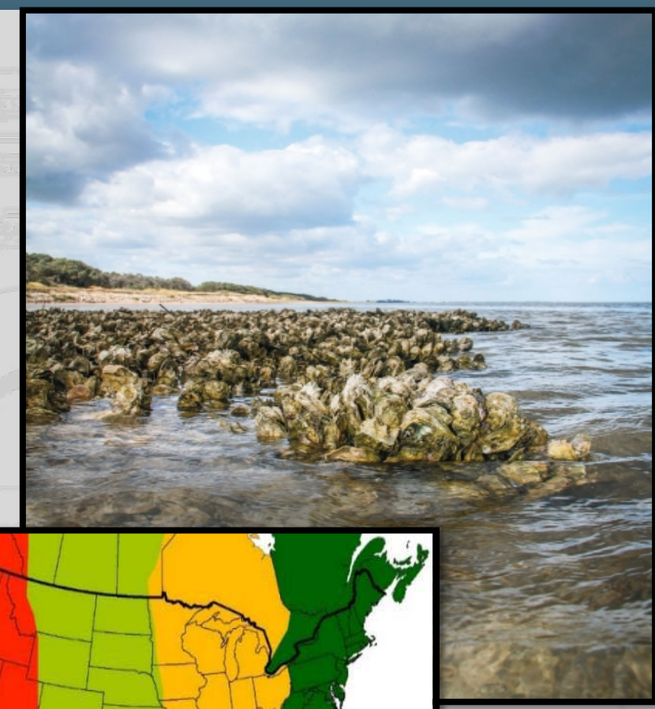
- 40% of the Nation's petrochemical industry
- 25% of national petroleum-refining capacity

Critical Infrastructure

- NASA
- UTMB – Level 4 Viral Laboratory

SIGNIFICANT NATURAL RESOURCES

- **Critical coastal ecosystems** including wetlands, seagrass beds, oyster reefs, and sea turtle nesting habitat
- **Critical Habitat** threatened and endangered species
- 2 of 28 **National Estuary Program sites -** Galveston & Corpus Christi Bays
- **Central Flyway Migration Corridor**
- The **Laguna Madre -** a rare hypersaline lagoon
- **Nursery habitat** and **significant commercial fisheries** for oysters, shrimp, and finfish
- **Padre Island National Seashore**
- **12 National Wildlife Refuges**

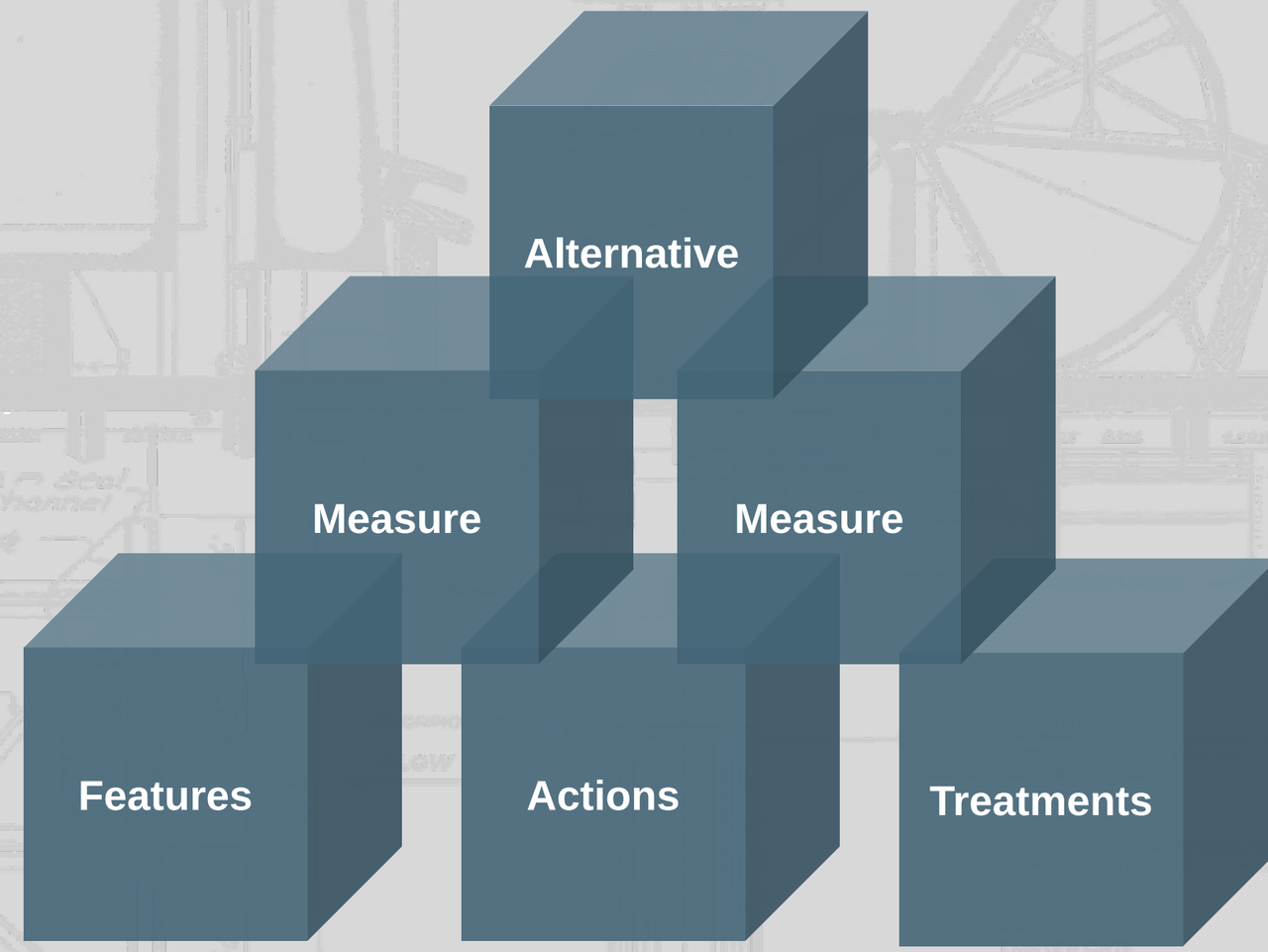


USACE PLAN FORMULATION

- In USACE-speak. . . .
  - **Features** => levees, marshes, gates, etc
  - **Actions** => restoration, construction, raisings, etc.
  - **Treatments** => nourishments, plantings, etc

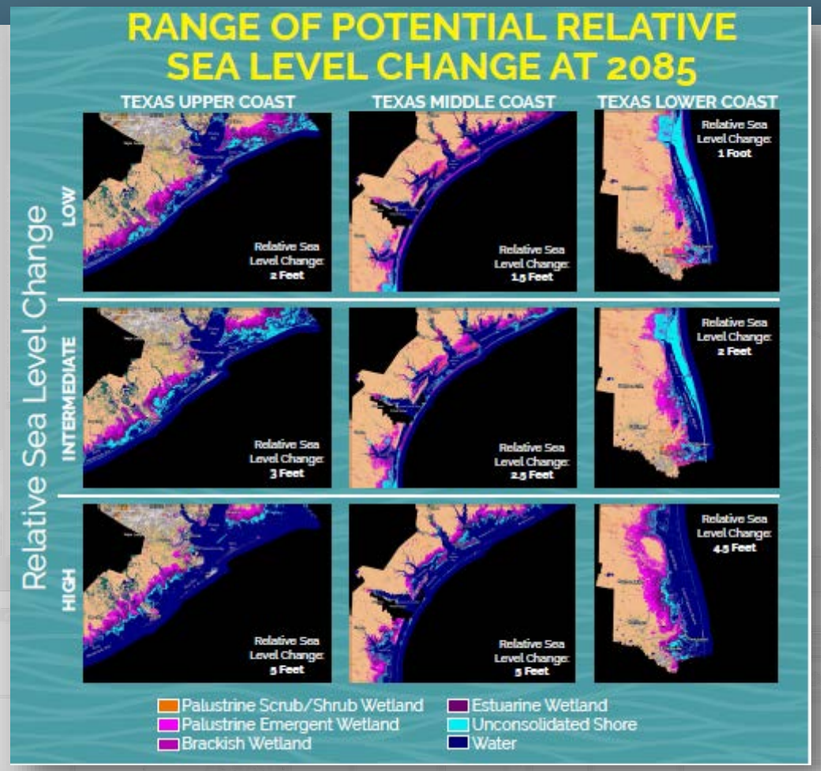
- Are combined to produce **Measures**

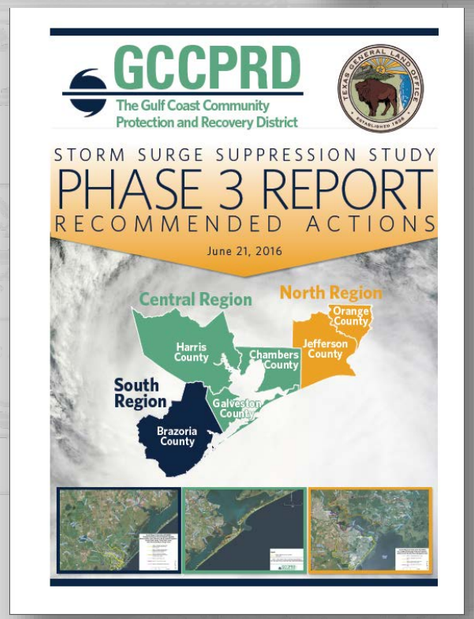
- Combinations of Measures generate **Alternatives**

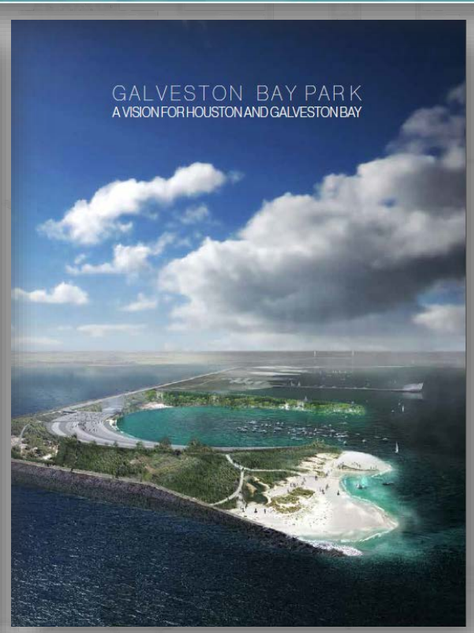


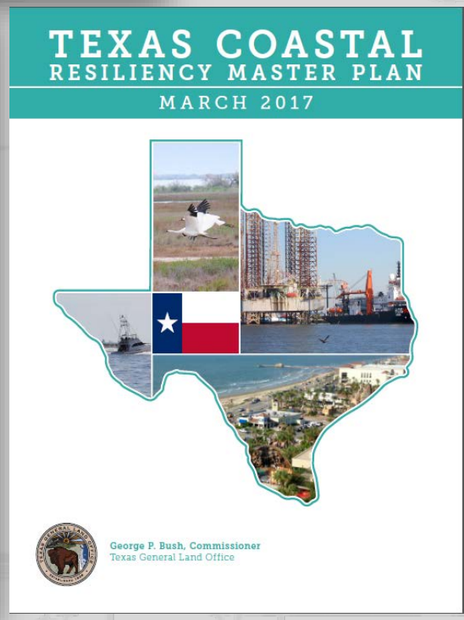
USACE PLAN FORMULATION

1. Data was produced by:
    - NOAA Sea Level Rise Viewer
    - Texas Shoreline Change Rates
    - National Structure Inventory Database
    - FEMA Inundation Mapping
    - NOAA's Sea Lake and Overland Surges from Hurricanes (SLOSH) Model
2. Features/actions/treatments were developed based on existing & past studies from:
    - GCCPRD
    - Texas A&M
    - SSPEED Center
    - USACE
    - GLO
3. AND from scoping meetings held in 2014.
4. Measures were then formulated meet the goals and objectives.

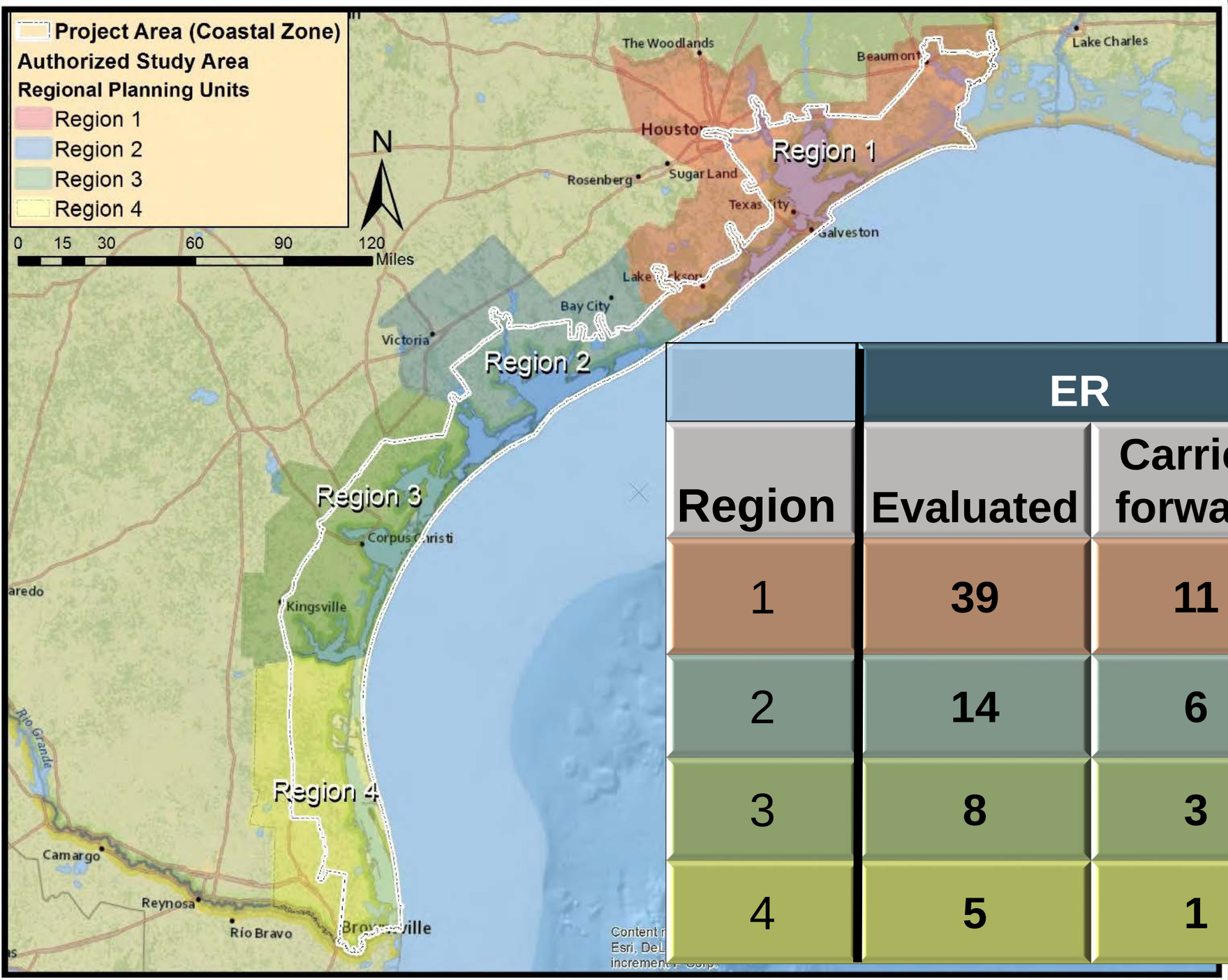








MEASURE SCREENING

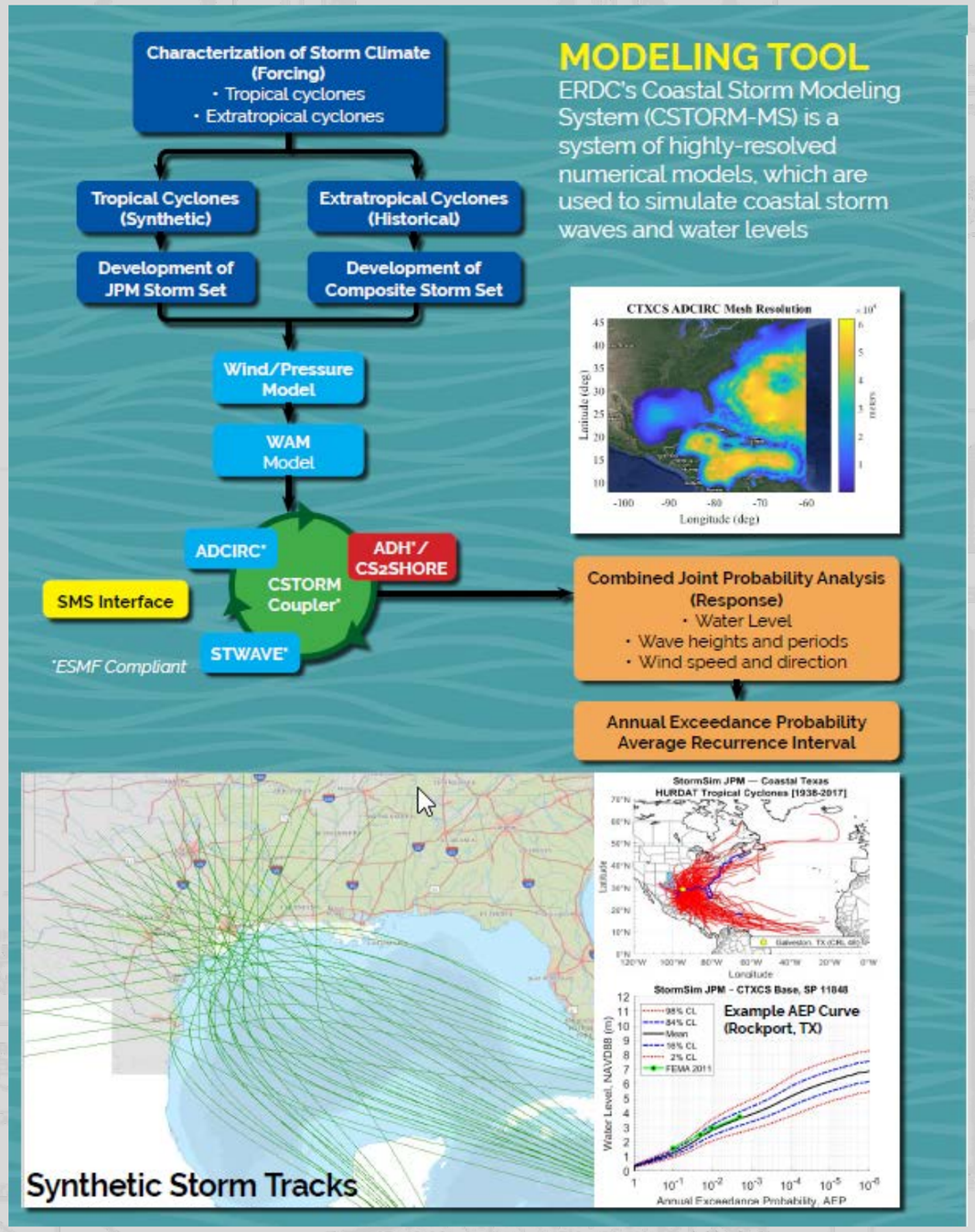


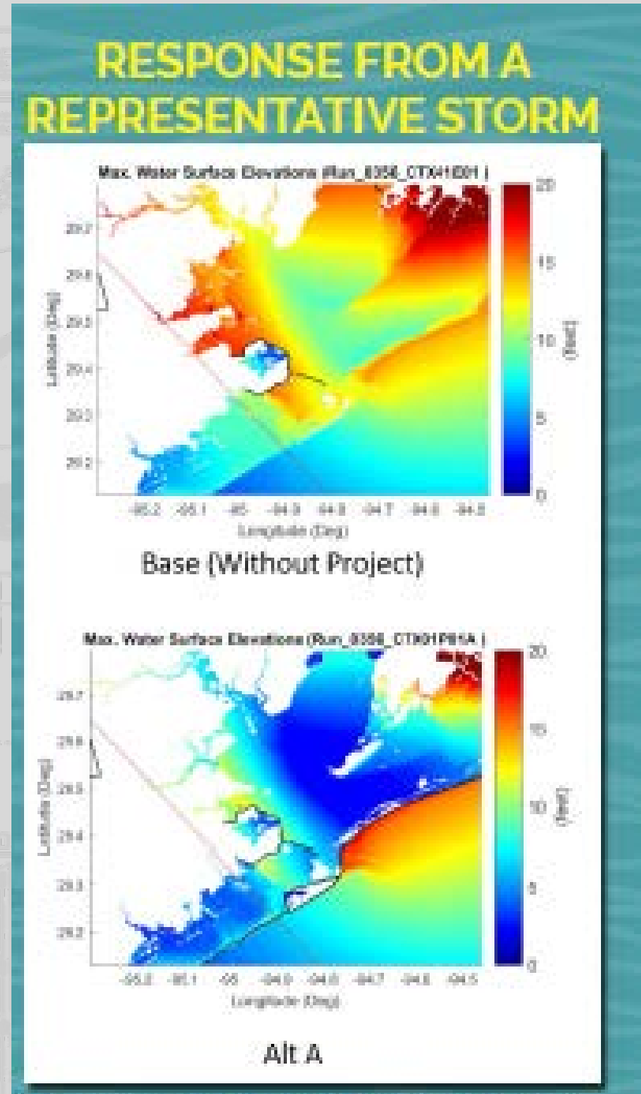
	ER		CSRM	
Region	Evaluated	Carried forward	Evaluated	Carried Forward
1	39	11	18	13
2	14	6	4	2
3	8	3	2	0
4	5	1	1	1

PLAN EVALUATION & COMPARISONS

Feasibility studies evaluate alternatives to identify a plans that are:

- ✓ Engineeringly sound
- ✓ Environmentally acceptable
- ✓ Economically justified





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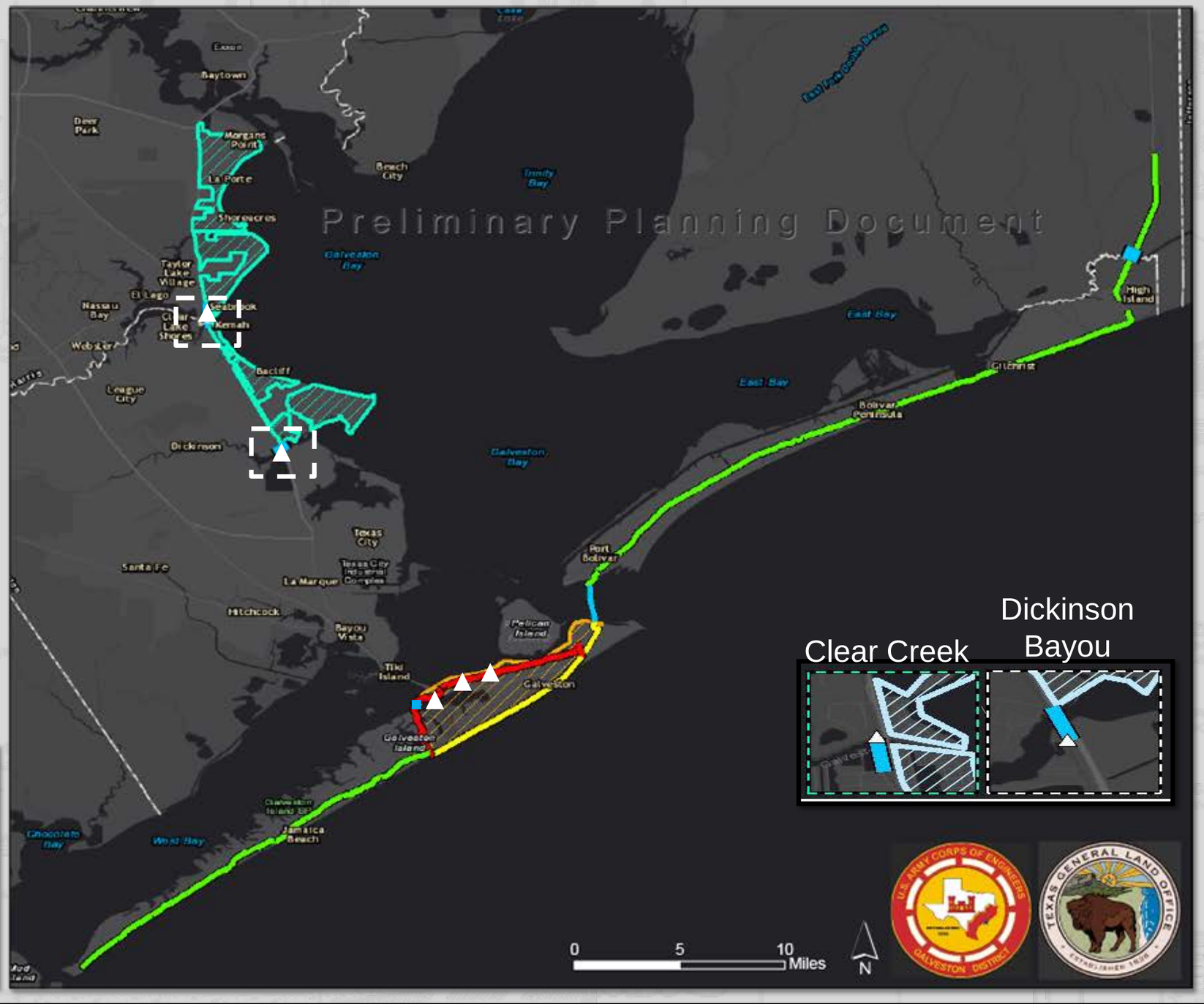
ALTERNATIVE A: COASTAL BARRIER

Coastal Texas Protection and Restoration Feasibility Study

Alternative A

- Navigation and Environmental Gates
- Levees/Floodwalls
- Galveston Ring Levee *
- Galveston Seawall Improvements
- Galveston Island Nonstructural Improvements
- Nonstructural Improvements

* One or both of these features may be selected



Clear Creek

Dickinson Bayou

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ALTERNATIVE D2: BAY RIM

Coastal Texas Protection and Restoration Feasibility Study

Alternative D2

- Navigation and Environmental Gates
- Levees/Floodwalls
- Galveston Ring Levee
- Galveston Seawall Improvements
- Texas City Hurricane Flood Protection Levee Improvements
- Navigation Gate
- Environmental Gate

UPPER COAST CSRM PLAN COMPARISONS

Plan A

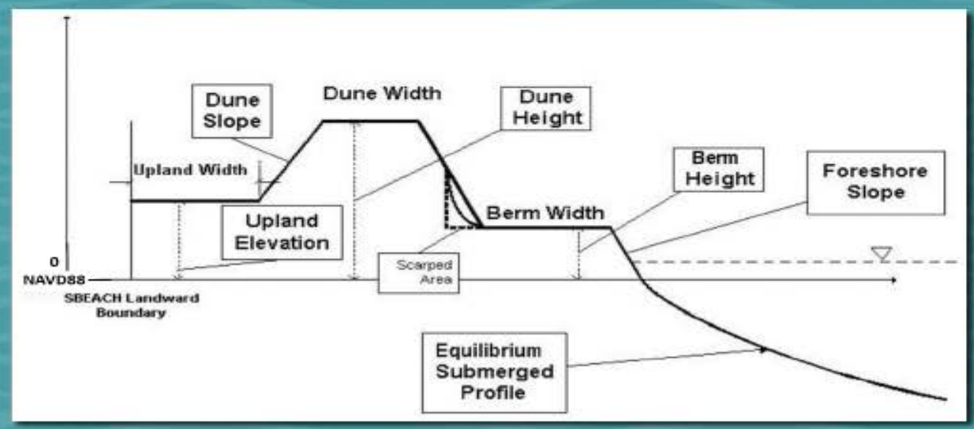
- Region wide CSRM system **focusing on all benefit categories**, Measured and Unmeasurable
- Provides **risk reduction** to the regions **critical navigation features**
- Potential induced damages in areas **where structures are already raised**
- The **Galveston Ring Levee** is only needed to address **wind driven surges** from the north.
- **As the regions population expands** westward and eastward the system provides **some level of risk reduction**
- **Maintains** the regions critical landscape features
- **Provides** risk reduction the regions **evacuation routes**
- **System can easily be adapted** to address extreme events due the bay's storage capacity

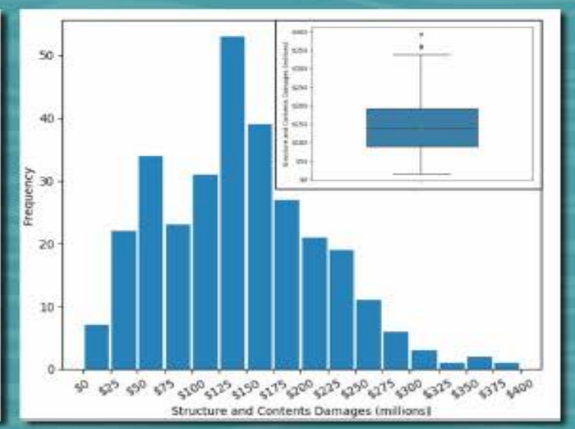
Plan D2

- Region wide CSRM system **focusing on dense industrial and commercial benefit area**
- **Leaves** the regions **critical navigation features outside** of the system
- Potential induced damages in areas **where surge can flank the system**
- The **Galveston Ring Levee** to address **wind driven surges** from the north **AND induced stages**
- **As the regions population expands** westward and eastward the system **leaves the population out**
- **System could be closed off** to address nuisance flooding if RSLR becomes an issue
- **Under extreme events** when the system is overtopped the **area is immediately inundated** increasing the life safety risk

LOWER COAST CSRM
SOUTH PADRE ISLAND

- Beneficial Use (BU) of dredge material has been used historically to offset long term erosion since 1988
- BU efforts uncertain when timing and funding is limited
- 2 miles of 12.5’ x 100’ dune
- 10-year renourishment cycles





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ECOSYSTEM RESTORATION MEASURES

Coastal Texas Ecosystem Restoration Alternative 1

Coastwide All-Inclusive Restoration Alternative

La Grange
Houston
Baytown
Pasadena
Sugar Land
Missouri City
Rosenberg
Pearl
League City
Texas City
Galveston
Angleton
Lake Jackson
Bay City
Beeville
Corpus Christi
Alice
Kingsville

0 25 50 Miles

N

G28
Bolivar Peninsula and West Bay GIWW Shoreline and Island Protection

G5
Bolivar Peninsula/ Galveston Island Gulf and Beach Dune Restoration

B12
Bastrop Bay, Oyster Lake, West Bay,and GIWW Shoreline Restoration

B2
Follets Island Gulf Beach and Dune Restoration

M8
East Matagorda Bay Shoreline Protection

W3
Port Mansfield Channel and Island Rookery Restoration

SP1
Redfish Bay Protection and Enhancement

CA5
Keller Bay Restoration

CA6
Magnolia to Port O'Connor Shoreline Protection and Restoration

THE TENTATIVELY SELECTED PLAN (TSP)

Coast-wide system of ecosystem restoration and storm-risk management features

TSP supports the resilience of coastal communities and natural habitats in Coastal Texas

Coastwide:

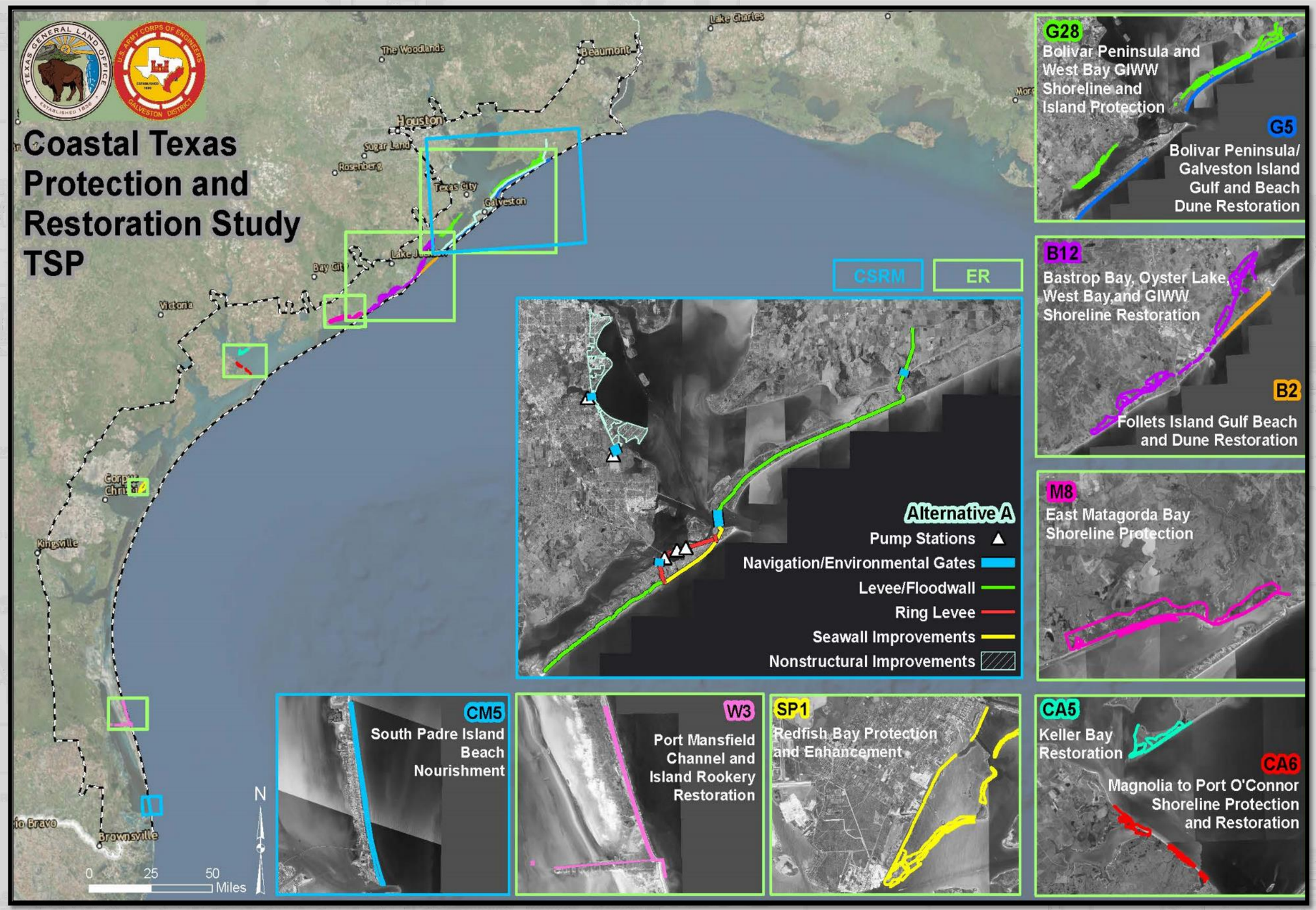
Large scale ER features which focus on critical landscape features and areas of threatened biologically diverse ecosystems

Lower Coast:

CSRM Dune and beach restoration project on South Padre Island

Upper Coast:

CSRM surge barrier system to protect the Houston-Galveston Region (Coastal Spine)



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TSP TOTAL PROJECT COST

COASTWIDE ER MEASURES
ER (ALT 1-2) = $8.9B – $11.9B

LOWER COASTWIDE CSRM MEASURES
SOUTH PADRE ISLAND (REACHES 3 & 4) = $71.6M – $83.1M

UPPER COASTWIDE CSRM MEASURES
ALTERNATIVE A (COASTAL BARRIER) = $14.2B – $19.9B

ENVIRONMENTAL IMPACTS & MITIGATION

- **Direct Impacts**
  - Alt A (TSP): 4,525.3 acres
  - Alt D2: 2,334.3 acres
  - South Padre: 365.8 acres

- **Indirect Impacts:**
  - Altered tidal exchange
  - Reduced velocities in Galveston Bay

- **Ecosystem Restoration Benefits**
  - 160,000 acres of marsh, islands, dunes, beaches & oyster reefs

<u>TOTAL MITIGATION COST RANGE:</u>

$676 M – $906 M

ALTERNATIVE A:COASTAL BARRIER
PHASED DESIGN & OPTIMIZATION

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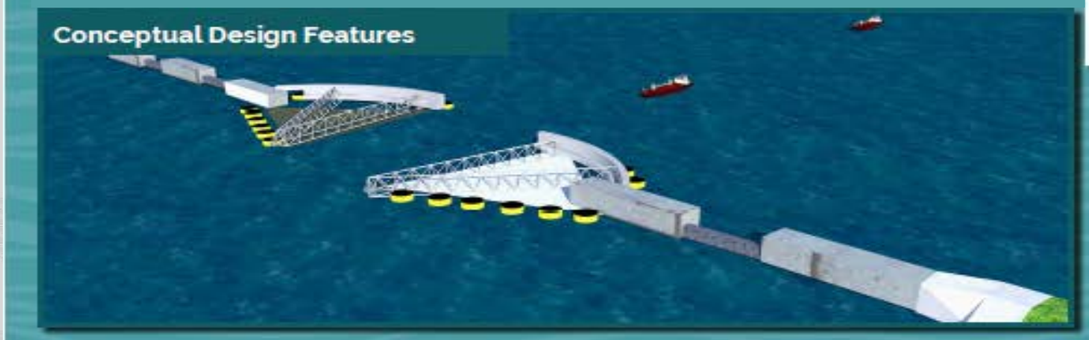
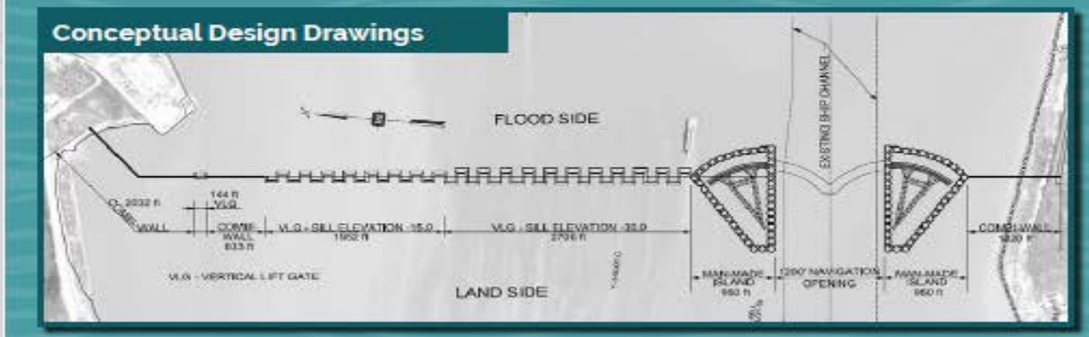
Coastal Texas Study DIFR-EIS

- Used for Baseline Design and Cost development for alternative identification and evaluation
- Used to inform baseline Environmental Impacts
- Based on known designs and risk, based on existing projects

Conceptual Design Features



Conceptual Design Drawings



Conceptual Construction Position Within Navigation Areas

Post Public/ Independent/ Policy Review & Contingent on Agency Decision Milestone Approval

Focus on Scaling Measures and Features

- Continue to focus on avoiding, minimizing and reducing environmental impacts
- Focus on Risk and Reliability
- Focus on Operation Concerns
- Focus on Construction Cost Concerns

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NEXT STEPS

ESTIMATED PROJECT SCHEDULE

Study Complete - Request Congressional Authorization for Project(s) 2021

Local Sponsor(s) Maintain Project

STUDY

WE ARE HERE

DESIGN

2-5 Years AFTER Authorization (Estimated)

BUILD

10-15 Years Dependent on Congress (Estimated)

MAINTAIN

50+ Years (Project Life)

Congressional Appropriations for Authorized Projects

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COMMENT SUBMISSION OPTIONS

#1 - Attend a Public Meeting

Lower Coast

27-Nov | *5:30pm – 9:00pm* | ***Port LaVaca*** ✓
Bauer Community Center
2300 TX-35, Port Lavaca, TX 77979

28-Nov | *5:30pm – 9:00pm* | ***Corpus Christi*** ✓
Harte Research Institute Texas A&M Corpus Christi
6300 Ocean Drive, Corpus Christi, TX 78412

29-Nov | *5:30pm – 9:00pm* | ***Port Isabel*** ✓
Port Isabel Event & Cultural Center
309 Railroad Avenue, Port Isabel, TX 78578

Upper Coast

11-Dec | *5:30pm – 9:00pm* | ***Winnie*** ✓
Winnie Community Building
335 South Park Street, Winnie, TX 77665

12-Dec | *5:30pm – 9:00pm* | ***Galveston*** ✓
Galveston Island Convention Center
5600 Seawall Blvd, Galveston, TX 77551

15-Dec | *1:00pm – 4:00pm* | ***Crystal Beach*** ✓
Crenshaw Elementary and Middle School
416 State Hwy 87, Crystal Beach, TX 77650

18-Dec | *5:30pm – 9:00pm* | ***Seabrook*** ✓
Bay Area Community Center
5002 E NASA Parkway, Seabrook, TX 77586

#2 - Send a Letter

MAIL TO:

U.S. Army Corps of Engineers
Galveston District
Attn: Ms. Jennifer Morgan
Environmental Compliance Branch
Regional Planning and Environmental Center
P.O. Box 1229
Galveston, TX 77553-1229

#3 - Send an Email

CoastalTexas@usace.army.mil

Deadline:

January 9, 2019

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COASTALSTUDY.TEXAS.GOV